Index

to

1944 Transactions

A

Page

Additions in Malleable Iron Melting ... 452
Adhering Sand, Mechanism in Cast Iron Practice ... 1313
Ageing of Aluminum Alloy, Natural and Artificial ... 1037, 1051
Air-Hardening Steel, Making and Heat Treating Castings of ... 814

Alloy:
- Cast Irons, Effect of Ladle Inoculants in ... 695
- Cast Steel, Chemical Composition Control of ... 467
- Castings, Effect of Alloying Elements on Aluminum ... 789
- Die Castings, Design of Aluminum ... 544

Alloying Air-Hardening Steel ... 815

Alloys:
- Aluminum, Cold Chamber Die Casting Process ... 543
- Aluminum, Development of Magnesium-Zinc Type ... 798, 1037
- Aluminum, Die Design for Casting ... 544
- Aluminum, Effect of Grain Refiners on Properties of ... 811
- Aluminum, Effect of Silicon, Manganese and Chromium on ... 800
- Aluminum, Silicon Type ... 802
- Castable in Investment Molds ... 360
- Cupola Melting of High-Lead ... 1141
- Effect of High Antimony Content in Tin for Bronze ... 232
- Non-Ferrous, Centrifugal Process Influence on Properties of ... 393, 401

Aluminum:
- Additions in Centrifugal Steel Casting ... 328, 330
- Aircraft Castings, Production Control of ... 475, 478
- Casting, Gas Porosity in ... 1116
- Casting, Shrink Porosity in ... 1117
- Castings, Body Cores for ... 25
- Castings, Cylinder Head, Women in Production of ... 16, 48
- Castings, Radiographic Inspection of ... 475
- Effects of Iron, Silicon, Manganese, Copper, Tin and Zinc Contents in ... 790, 792
- Foundry Layout ... 20
- Foundry Practice, Core Binders in ... 1322
- Foundry Sand, Preparation and Properties of ... 18, 23
- Magnesium-Zinc Alloys, Development of ... 798, 1037
- Magnesium-Zinc Alloys, Effect of Iron on ... 799
- Permanent Mold Castings, Mechanized Production of ... 49, 112

Aluminum Alloys:
- Artificial Ageing of ... 1042
- Casting, Effect of Alloying Elements on ... 789
- Casting, Stress Segregation in ... 1118
- Cold Shut in ... 1120
- Corrosion Fatigue and Resistance in ... 1045
- Development and Properties of High Strength ... 1037
- Die Casting by Cold Chamber Process ... 543, 544
- Die Castings, X-ray Inspection of ... 547
- Dimensional Stability After Ageing ... 1051
- Effect of Grain Refiners on Properties of ... 811
- Effect of Silicon, Manganese and Chromium on ... 800
- Natural Ageing of High Strength ... 1039
- Permanent Mold Casting, Properties of ... 103
- Silicon Type ... 802

Index

to

1944 Transactions

A

Page

Additions in Malleable Iron Melting ... 452
Adhering Sand, Mechanism in Cast Iron Practice ... 1313
Ageing of Aluminum Alloy, Natural and Artificial ... 1037, 1051
Air-Hardening Steel, Making and Heat Treating Castings of ... 814

Alloy:
- Cast Irons, Effect of Ladle Inoculants in ... 695
- Cast Steel, Chemical Composition Control of ... 467
- Castings, Effect of Alloying Elements on Aluminum ... 789
- Die Castings, Design of Aluminum ... 544

Alloying Air-Hardening Steel ... 815

Alloys:
- Aluminum, Cold Chamber Die Casting Process ... 543
- Aluminum, Development of Magnesium-Zinc Type ... 798, 1037
- Aluminum, Die Design for Casting ... 544
- Aluminum, Effect of Grain Refiners on Properties of ... 811
- Aluminum, Effect of Silicon, Manganese and Chromium on ... 800
- Aluminum, Silicon Type ... 802
- Castable in Investment Molds ... 360
- Cupola Melting of High-Lead ... 1141
- Effect of High Antimony Content in Tin for Bronze ... 232
- Non-Ferrous, Centrifugal Process Influence on Properties of ... 393, 401

Aluminum:
- Additions in Centrifugal Steel Casting ... 328, 330
- Aircraft Castings, Production Control of ... 475, 478
- Casting, Gas Porosity in ... 1116
- Casting, Shrink Porosity in ... 1117
- Castings, Body Cores for ... 25
- Castings, Cylinder Head, Women in Production of ... 16, 48
- Castings, Radiographic Inspection of ... 475
- Effects of Iron, Silicon, Manganese, Copper, Tin and Zinc Contents in ... 790, 792
- Foundry Layout ... 20
- Foundry Practice, Core Binders in ... 1322
- Foundry Sand, Preparation and Properties of ... 18, 23
- Magnesium-Zinc Alloys, Development of ... 798, 1037
- Magnesium-Zinc Alloys, Effect of Iron on ... 799
- Permanent Mold Castings, Mechanized Production of ... 49, 112

Aluminum Alloys:
- Artificial Ageing of ... 1042
- Casting, Effect of Alloying Elements on ... 789
- Casting, Stress Segregation in ... 1118
- Cold Shut in ... 1120
- Corrosion Fatigue and Resistance in ... 1045
- Development and Properties of High Strength ... 1037
- Die Casting by Cold Chamber Process ... 543, 544
- Die Castings, X-ray Inspection of ... 547
- Dimensional Stability After Ageing ... 1051
- Effect of Grain Refiners on Properties of ... 811
- Effect of Silicon, Manganese and Chromium on ... 800
- Natural Ageing of High Strength ... 1039
- Permanent Mold Casting, Properties of ... 103
- Silicon Type ... 802

Aluminum Alloys:—*continued* *Page*
Tensile Properties, Effect of Natural and Artificial Ageing on....1041
Welding....1045

Analyses of Cupola Cases....824
Analyses, Factors in Coke....831

Analysis:
of Cast Iron, Malleable Iron and Steel, Combined Method of Chemical....913
of Cast Irons, Inoculated and Untreated....676
Comparisons of Spectrographic and Chemical....901
of Copper-Bearing Cast Steels, Chemical....1154
Electric Analogy Method of Heat Flow....652, 655
Equipment for Spectrographic....249
Experimental Methods of Heat Flow....659
Spectrographic....248, 891, 900
X-ray Micrography in Casting....1115

Annealing:
Costs in Pulverized Coal Fired Malleable....559
Cycle in Pulverized Coal Fired Malleable Kiln....557
Heat Flow Problems in....651
Iron: Coal Ratio in....557
Kilns, Pulverized Coal Firing of Malleable....552, 554

Antimony Content in Tin for Bronze Alloys, Effect of High....232
Antimony in Fired Cartridge Brass, Effect of....527
Apparatus for Measuring Permeability in Plaster Molds....965
Atmosphere Control, Mold....1053, 1064
Atmospheres in Brass and Bronze Melting, Effect of....848

B

Bentonite Additions, Effect on Metal Penetration in Mold....1070
Bentonite vs. Bond Clay, Bonding Properties of Western....864

Bibliography on:
Ageing Aluminum Alloys....1051
Brass and Bronze Melting....851
Cast Iron Ladle Inoculation....705
Cast Steel Test Coupon Design....1265
Centrifugal Casting of Steel....329
Converter Refractories....869
Copper-Bearing Carbon-Molybdenum Cast Steels....1168
Cupola Melting of Non-Ferrous Metal....1142
Effect of Copper in NE and Low-Alloy Cast Steels....515
Effects of Superheating on Structure and Properties of Cast Iron....156
Foundry Coke....845
Foundry Heat Flow Problems....670
Foundry Occupational Disease Control....1363
Hardenability of Cast Steels....472, 1344
Molding Methods....1136
Non-Destructive Testing of Steel Castings....975
Precision Casting by Investment Molding Process....381
Steel Foundry Sand Properties at Elevated Temperatures....1007
Thermosetting Plastic Core Binders....1324
Toxicity of Electric Furnace Fumes....1371

Utilization of Fired Cartridge Brass in Manganese Bronze....534
Bonds *(See Clays and Sands)*:

Boron on Steel Hardenability, Effect of....1338

Brass:
and Bronze Melting Conditions....849, 851
and Bronze Test Bar Casting Procedure....1181
in Manganese Bronze, Utilization of Fired Cartridge....527, 534

Brass:—*continued*
Page
Melting, Causes of Test Bar Failures in....1176, 1181
Melting, Effects of Water Vapor, Carbon Reactions and Temperatures in..846, 848
Solubility of Various Elements in Molten.... 846
Surface Preparation for Tinning....781
Test Bars, Failures in....1175
Test Bars, Gating and Risering for....1182

Brazing Gray Iron to Unlike Materials.... 775

Bronze:
Alloys, Effect of High Antimony Content in Tin for.... 232
and Brass Melting Conditions....849, 851
and Brass Test Bar Casting Procedure....1181
Casting, Centerline Shrinkage and Gas Porosity in....1121
Castings, Gas Porosity in Tin.... 853
Effects of Antimony and Lead on Properties of Manganese....533, 538
Manganese, Utilization of Fired Cartridge Brass in.... 527
Melting, Causes of Test Bar Failures in....1176, 1181
Melting, Effects of Water Vapor, Carbon Reactions and Temperature in..846, 848
Segregation in Leaded....1119
Solubility of Various Elements in Molten.... 846
Surface Preparation for Tinning.... 781
Test Bars, Failures in....1175
Test Bars, Gating and Risering for....1182

C

Carbon:
Cast Steel, Hardenability of.... 465
Cast Steel, Heat Treatment of Medium.... 539
Equivalent as a Function in Effect of Superheating on Properties and Structure of Cast Iron....162, 169
Molybdenum Cast Steel, Bibliography on Copper-Bearing....1168
Molybdenum Cast Steel, Composition of....1153
Molybdenum Cast Steels, Cooling Rate of Copper-Bearing....1155, 1161, 1173
Molybdenum Cast Steel, Effect of Copper in....1151, 1162
Monoxide and Hydrogen in Superheating Cast Iron, Effects of....153, 161
and Silicon Contents, Properties of Untreated and Inoculated Cast Iron vs.... 684
Steel for Hot Tear Prevention, Use of Low.... 908
Steel, Melting Practice for Special Low.... 910

Cast Iron:
Brazing to Unlike Materials 775
Carbon Equivalent as a Function in Effects of Superheating on....162, 169
Chemical Analysis, Combined Method 913
Chromium, Nickel and Molybdenum Determination in.... 917
Cupola Melted, Variations in 3
Cylinder Production, Four-Part Cheek Method of.... 517
Development and Testing of Ladle Inoculants for.... 674
Effect of Carbon Monoxide and Hydrogen in Superheating....153, 161
Effect of Chromium-Bearing Inoculants on Properties of Cupola.... 699
Effect of Ladle Inoculation on Uniform Properties of....688, 690
Effect of Nickel Inoculant on Chill Depth of.... 707
Effects of Nucleation in Superheating.... 152
Effect of Si-Mn-Zr Inoculant on Properties of.... 671
Effect of Small Amounts of Elements on.... 5
Effects of Superheating Factors on Structure and Properties of....113, 158
Electroplating Tin to.... 772
Equipment and Experimental Procedure, Superheating Effects on.... 120
Gases as a Cause of Superheating Effects on.... 152
Heredity in.... 3
Hydrogen and Humidity as Factors in Melting.... 5, 6
Ladle Inoculants, Essential Properties of.... 672
Ladle Inoculations, Bibliography on.... 705

Cast Iron:—*continued* *Page*
Mechanism of Adhering Sand in....1313
Phosphorus Determination in.... 915
Properties vs. Silicon and Carbon Contents, Untreated and Inoculated.... 684
Reduction in Chilling Tendency Through Inoculation.... 678
Spectrographic Analysis of.... 248
Steel Plus Graphite....1266
Structural Alterations Following Inoculation.... 692
Surface Preparation for Tinning.... 768
Tensile and Transverse Strengths, Effect of Ladle Inoculants on.... 686
Theories Explaining Superheating Effects on....114, 117
Welding to Unlike Materials.... 773

Cast Irons, Analysis and Properties of Untreated and Inoculated.... 676
Cast Irons, Effect of Ladle Inoculants in Alloy.... 695

Casting:
Alloys, Effect of Alloying Elements on Aluminum.... 789
Centrifugal, Adhering Sand in Steel.... 331
Centrifugal, Advantages of.... 313
Centrifugal, Aluminum Additions in Steel....328, 330
Centrifugal, Bibliography on Steel.... 329
Centrifugal, Calculated Cavity Shapes in Vertical.... 315
Centrifugal, Core Sand Mixture in....275, 279
Centrifugal, Defects Due to High Spinning Speeds.... 344
Centrifugal, Design of Die Molds for....289, 300
Centrifugal, Finished Dimensions in.... 309
Centrifugal, Force Formula for.... 371
Centrifugal, Formulas for Spinning Speeds and Pressure.... 335
Centrifugal, Green Sand Molds in.... 302
Centrifugal, Heat Transfer in 337
Centrifugal, Machine Designs for.... 343, 384, 387, 408
Centrifugal, Machine Spinning Speeds 333, 344
Centrifugal, Machining Allowance in.... 331
Centrifugal, Methods of Pouring.... 340
Centrifugal, Metal Flow in Vertical and Inclined Molds....334, 339
Centrifugal, Metal Types and Combinations in.... 309
Centrifugal, Mold Cavity in 334
Centrifugal, Molding and Pouring in.... 273
Centrifugal, Mold Temperature Control in.... 411
Centrifugal, Molds for 314
Centrifugal, Non-Ferrous Metals.... 407
Centrifugal, Operating Practice in Permanent Mold.... 291
Centrifugal, Power Requirements in.... 410
Centrifugal, Properties of Non-Ferrous Alloys in....393, 401
Centrifugal, Properties in Vertical and Horizontal.... 403
Centrifugal, Quality of.... 310
Centrifugal, Safe Machine Operation in.... 384
Centrifugal, Segregation in 330, 343
Centrifugal, Spinning Axes in 315
Centrifugal, Spinning Speed Calculation....316, 334
Centrifugal, Spinning Speed Factors for Acceleration and Flow in.... 339
Centrifugal, Steel Structure and Properties in....313, 319, 327
Centrifugal, Time Factors in.... 370
Centrifugal, Types of 314
Centrifugal, Yield in 309
and Coining Malleable Iron....1146
Defects, Magnetic Powder Indications of.... 210
Die, Aluminum Alloys by Cold Chamber Process.... 543
Die, X-ray Inspection in Aluminum Alloy.... 547
Inspection, Purchasers' Aspects of 750
Permanent Mold, Aluminum Practice.... 83
Precision, Investment Molding Process Details....349, 383

Castings: *Page*
Air-Hardening Steel, Making and Heat Treating ... 814
Aluminum and Magnesium Aircraft ... 475
Classification for Application of Radiographic Standards ... 179
Consumer's Viewpoint of ... 884
Design of Aluminum and Magnesium Aircraft ... 476, 478
Flame Excavation of Defects in ... 195
Influence of Non-Destructive Tests on Conditioning of ... 176
Magnetic Powder Inspection of Large ... 205, 227
Magnetic Powder Inspection, Variables in ... 212, 225
Methods and Equipment for Magnetic Powder Inspection of ... 182, 199, 207
Molding Methods for Sound ... 1126
Penetration Defects in ... 1053
Permanent Mold, Mechanized Production of Aluminum ... 49, 71
Radiographic Inspection of Aluminum and Magnesium ... 475
Radiographic Standards of Acceptability ... 178
Solidification Rates in ... 651
Special Low-Carbon Steel for ... 904
Surface Preparation of ... 768

Cement Patterns, Methods of Making ... 1271, 1282

Centrifugal Casting *(See Casting, Centrifugal)*:

Chemical:
Analysis of Cast Iron, Malleable Iron and Steel, Combined Method for ... 913
Analyses of Copper-Bearing Cast Steels ... 1154
Composition Control of Alloy Cast Steel ... 467
Reactions in Cupola ... 822
Reactions of Refractories and Metals ... 856
and Spectrographic Analysis, Comparisons of ... 901

Chill Coatings, Use of ... 1131

Chills:
on Bore Cracking in Flanged Steel Castings, Effect of ... 1225, 1235
on Malleable Iron Solidification Rate, Effect of ... 489, 495
Position of ... 1130

Chromium:
Alloys, Dust and Fume Toxicity of ... 1368
on Aluminum Alloys, Effect of ... 800
Bearing Inoculants on Properties of Cupola Iron, Effect of ... 699
in Hard Iron, Gray Iron, Malleable Iron and Steel, Determination of ... 917
Molybdenum Cast Steel, Hardenability of ... 466

Clay vs. Western Bentonite, Bonding Properties of Bond ... 864

Cleaning:
Aluminum Cylinder Head Castings ... 39
Aluminum Permanent Mold Castings ... 89, 91
Sanitation, Metal ... 1347

Coatings, Use of Chill ... 1131
Coining Malleable Iron ... 1146
Coke, Foundry ... 7, 13, 819, 845
Coke on Mold Atmosphere, Effect of ... 1066

Committee Report on:
1944 Foundry Sand Research Project ... 960
Methods of Producing Steel for Castings ... 782
Non-Destructive Testing of Steel Castings ... 973
Physical Properties of Steel Foundry Sands at Elevated Temperatures ... 977, 979
Rammer Supports in Physical Property Tests of Steel Foundry Sands at Elevated Temperatures ... 1024
Sintering Test of Foundry Sands ... 1311

Page
Compressive Strength Tests of Sand Mixtures, Elevated Temperature 719
Control of Occupational Disease in Foundry 1347, 1371

Converter:
Electric Eye Control of 858
Linings, Development of Rammed Type 858, 869
Refractories, Bibliography on 869

Conveyor System for Small Foundry, Mold 414, 416
Cooling Rate of Carbon-Molybdenum Copper-Bearing Cast Steels 1155, 1161, 1173

Copper:
Bearing Cast Steels, Properties of 503, 511, 1154, 1172
in Carbon-Molybdenum Cast Steel, Effect of 1151, 1162
Content in Aluminum, Effect of 792
on Creep Resistance of Carbon-Molybdenum Cast Steel, Effect of 1163, 1171, 1174
in NE and Low-Alloy Steels, Effect of 501, 515

Core Binders, Thermosetting Plastic 1317, 1323

Core:
Construction in Aluminum Permanent Mold Casting 55, 69
Cross Section of Side Cheek 520
Knock-Out, Aluminum Permanent Mold Castings 87
Sand Mixture in Centrifugal Casting 275, 279

Coremaking Line, Aluminum Foundry 28

Cores:
for Aluminum Cylinder Head Castings 25, 32
in Malleable Iron Casting, Use of 616, 643
Necking, for Cast Steel Test Coupons 1261
Plaster, Effect of Composition on Permeability of 971
Ramming Cheek 518
for Steel Castings 871

Corrosion Resistance of Aluminum Alloy 1045
Costs in Precision Casting 374
Costs in Pulverized Coal-Fired Malleable Annealing 559
Cracks, Bore, in Flanged Steel Castings 1217, 1250
Creep Resistance of Carbon-Molybdenum Copper-Bearing Cast Steel 1163, 1174

Cupola:
Iron, Effect of Chromium-Bearing Inoculants on Properties of 699
Melting of Non-Ferrous Metal, Operating Practice in 1139, 1143
Operating Practice 820, 837
Raw Materials 1, 15
Refractory Installation 1138

D

Defects in Castings, Flame Excavation of 195

Design of:
Aluminum and Magnesium Aircraft Castings 476
Casting on Malleable Iron Solidification Rate, Effect of 485
Centrifugal Casting Machines 343, 384, 408
Cupola for Melting Non-Ferrous Metal 1137
Die Molds for Centrifugal Casting 289, 300
Dies for Casting Aluminum Alloys 50, 544
Flanged Steel Castings, Influence on Bore Cracking 1228, 1234
Gates 1126
Mold Cavity Vents 1134
Molds for Steel Castings 871
Patterns for Malleable Castings 612
Risers 1128
Test Coupons for Cast Steel 1251, 1265
Ventilating System for Electric Melting Furnaces 1349, 1353

Page

Developments in Ladle Inoculants for Cast Iron ... 674

Die:
- Casting Aluminum Alloys by Cold Chamber Process ... 543
- Casting, Cold Shots in ... 1123
- Castings, X-ray Inspection of Aluminum Alloy ... 547
- Mold Centrifugal Casting ... 288

Dilatometer Operation ... 1011
Drying Foundry Ladles ... 1286, 1288
Dust, Control of Foundry ... 1360

E

Electric Furnace:
- Bottoms, Specifications for Rammed ... 869
- Melting, Local Exhaust Ventilation in ... 1351
- Operation, Fumes in ... 1365

Electroplating Tin to Gray Iron ... 772
Elevated Temperatures, Properties of Mold Surfaces at ... 421
Elevated Temperature Sand Test Results, Reproducibility of ... 711, 719
Engineer in Foundry Production ... 1293, 1304
Equilibrium Diagram Applied to Mold-Metal Reactions ... 1076
Equipment, Maintenance of ... 784, 787

Equipment for:
- Air Filtering and Dust Collecting ... 1349
- Centrifugal Casting, Design of ... 384, 408
- Drying and Preheating Foundry Ladles ... 1289
- Elevated Temperature Sand Tests ... 715
- Foundry Conveyor System ... 414, 419
- Foundry Metal Control, Spectrographic ... 249, 889
- Four-Part Cheek Molding Method ... 518
- Gas Determination in Molding Materials ... 741
- Heat Flow Analysis by Electric Analogy ... 655
- Hot Permeability Tests ... 735
- Magnetic Powder Inspection ... 182, 199
- Making Gypsum Cement Patterns ... 1271
- Malleable Iron Melting Gas Analysis ... 449
- Measuring Permeability in Plaster Molds ... 965
- Physical Property Tests of Steel Foundry Sands at Elevated Temperatures ... 982, 1011
- Precision Casting ... 367, 375
- Pulverized Coal Firing of Malleable Annealing Kilns ... 553
- Testing Penetration, Metal, in Molds ... 1056
- X-ray Micrography ... 1112

Expansion:
- Investment Molding Setting ... 356
- Molding Sand, Confined and Free ... 425
- Pattern Wax ... 353
- Setting, of Gypsum Cements ... 1273, 1275
- Test of Molding Sand, Confined ... 423
- Casting Shrinkage and Compensating ... 354

F

Facing Materials for Forming Protective Mold Atmospheres, Use of Various ... 1065, 1069
Feeding Pressure on Malleable Iron Solidification Rate, Effect of ... 485, 488
Fired Cartridge Brass in Cast Manganese Bronze, Utilization of ... 527
Firing of Malleable Annealing Kilns, Pulverized Coal ... 552, 554
Fluorescent Penetrant Inspection ... 481
Fluxes, Cupola ... 14
Foreman Training, Methods of ... 564, 590
Foremen, Women as ... 577

Foundry: *Page*
Aluminum, Design for Use of Women in ... 16
Applied Science in ... 1303
Coke: A Critical Study ... 819, 845
Control, X-ray Micrography in ... 1111
Conveyorization, Small ... 414
Development of Engineer in ... 1304
Dust Control ... 1360
Fumes, Effects of Various ... 1359
Heat Flow Problems in ... 649, 670
Industry, Opportunities for Engineers in ... 1293, 1295
Layout, Aluminum ... 20
Metal Control, Spectrographic Equipment for ... 889
Methods of Occupational Disease Control in ... 1357, 1363
Mold Conveyor System, Small ... 416
Production, Engineer in ... 1293, 1300
Research, Engineer in ... 1298
Sand Handling in Aluminum ... 18
Sand Research Subcommittee on Sintering Test, Report of ... 1311
Technical Training Value to ... 1294
Training ... 1302
Ventilation, General ... 1362
Work, Classification of ... 1302

Furnace:
Atmospheres in Brass and Bronze Melting, Effect of ... 848
Annealing Cycle in Pulverized Coal Fired Malleable ... 554, 557
Bottoms, Specifications for Rammed Electric ... 869
Comparison of Cupola with Other Melting ... 1
Control in Malleable Melting ... 446
Electric Melting, Local Exhaust Ventilation of ... 1351, 1365
Linings, Operating Data on ... 935

Fumes, Foundry, Effects of Various ... 1359, 1371

G

Galvanizing Embrittlement in Malleable Castings ... 603
Gamma-Ray Radiography, Focus-Film Distance in ... 1095

Gas:
Porosity in Tin Bronze Castings ... 853
Pressure, Mold Surface ... 733, 743
Sampling System for Malleable Iron Melting ... 449
Volume Measurement for Molding Materials ... 737, 740

Gases, Analyses of Cupola ... 824
Gases as a Cause of Superheating Effects on Cast Iron ... 152
Gate Removal Methods for Malleable Castings ... 636

Gating:
Aluminum Cylinder Head Castings ... 18, 34
for Controlled Directional Solidification ... 1126
Flanged Steel Castings, Influence on Bore Cracking ... 1221, 1232
and Heading Malleable Castings ... 593, 623, 643
High Pressure Malleable Fittings ... 598
Location on Malleable Iron Solidification Rate, Effect of ... 484
for Malleable Fittings, Pattern ... 594
for Malleable Fittings, Method of Permanent ... 595
and Risering for Brass and Bronze Test Bars ... 1182
and Risering in Thermal Dissipation ... 761
Steel Castings ... 871

Grain Refiners on Properties of Aluminum Alloys, Effect of ... 811

Graphite: Page
Flakes, Space Model Construction 1266
Formation, Mechanism of 1266
in Malleable Iron, Effect of Primary 262
Nuclei Theory 4

Gray Iron *(See Cast Iron)*:

Grinding Aluminum Cylinder Head Castings 42
Grinding Dust, Control of 1360

H

Hardenability of:
Cast Steel, Carbon 465
Cast Steel, Chromium-Molybdenum 466
Cast Steel, Effect of Alloys and Grain Size on 1332
Cast Steel, Effect of Boron on 1338
Cast Steel, Effect of Cooling Rate on 462
Cast Steel, Effect of Section Size on 467
Cast Steel, Experimental and Theoretical 459, 472, 1325, 1344
Cast Steel, Medium Manganese 469
Cast Steel, Nickel Carburizing 468
Cast Steel, Tests of Copper-Bearing 511
Steel, End-Quench Test 463
Steel, Quantitative Measurement 460, 1331
Steel, Variables in 462

Hardening, Steel, Variables Determining Depth of 1328
Hardness Distribution in Carbon-Molybdenum Cast Steels, Effect of Welding on 1164, 1171
Hardness, Copper-Bearing Tempered Steel 503

Heading *(See Risering)*:

Heat:
Flow Analysis, Experimental Methods of 649, 670
Insulation, High Temperature 927
Loss in Malleable Iron Solidification, Skin Formation and 486
Transfer in Centrifugal Casting 337
Transfer in Malleable Iron Solidification Rate 487
Treatment of Air-Hardening Steel Castings 814
Treatment of Aluminum Cylinder Head Castings 43
Treatment of Aluminum Permanent Mold Castings 97
Treatment of Centrifugal Castings 280
Treatment of Medium Carbon Cast Steel 539
Treatment on Plain Carbon Steel Properties, Effect of 1326

Hot Permeability Measurements 734
Hot Strength of Mold Surface, Rate of Development 431
Hot Tear Prevention, Use of Low Carbon Steel for 908
Hot Tears in Steel Valve Flanges 904
Humidity as a Factor in Melting Cast Iron 6
Humidity in Spectrographic Analysis, Effect of 255
Hydrogen and Carbon Monoxide in Superheating Cast Iron, Effects of 153, 161
Hydrogen as a Factor in Cast Iron Melting 5

I

Inclusion, X-ray Micrograph of Dross 1120
Insulating Refractories, Foundry Applications of 927, 937
Inoculants in Alloy Cast Iron, Effect of Ladle 672, 710

Inspection:
of Aluminum Permanent Mold Castings, Dimensional 97
of Aluminum Alloy Die Castings, X-ray 547

Inspection:—*continued* *Page*
of Aluminum and Magnesium Castings, Radiographic 475
Comparison of Magnetic and Radiographic Casting 206
Fluorescent Penetrant 481
Pentrameter Types in Radiographic 1102
Purchasers' Aspects of Casting 750
Radiographic Specifications for Naval 1078, 1092
Radiography as a Complement to Magnetic Powder 190
Schedule, Plant and Equipment Maintenance 787
Steel Castings Classification for Radiographic 1083
of Steel Castings, Radiographic and Magnetic Powder 175, 199, 228
Symbols, Radiographic 1104
X-ray Micrography in Casting 1115

Investment Molding Process, Precision Casting by 349, 381

Iron *(See Cast Iron):*

K

Kiln *(See Furnace):*

L

Lead:
Alloys, Cupola Melting of High 1141
in Fired Cartridge Brass, Effect of 527
on Properties of Manganese Bronze, Effect of 538

Ladle:
Inoculants for Cast Iron, Essential Characteristics of 672
Lining Materials, Types of 1287
Linings, Specifications for Rammed 869

Ladles, Drying and Preheating of Foundry 1286, 1289
Ladles, Vent Holes in 1288
Lining Repair, Cupola 1142
Lining Materials, Types of Ladle 1287
Linings, Development of Rammed Type Conventer 858, 869
Linings, Operating Data on Furnace 935

M

Magnesium:
Aircraft Castings 478
Castings, Radiographic Inspection of 475
Foundry Practice, Core Binders in 1322

Magnetic Powder:
Indications, Types of 210
Inspection, Application to Cast Flanges 201
Inspection as a Complement to Radiography 190
Inspection, Methods for 182, 201, 207, 228

Maintenance of Plant and Equipment 784, 787

Malleable Iron:
Annealing, Iron: Coal Ratio in 557
Annealing Kilns, Pulverized Coal Firing of 552, 559
Casting and Coining of 1146
Casting, Elimination of Slag in 616
Casting Gate Removal, Methods of 636
Casting, Gating and Heading in 593, 604, 612, 623, 632
Casting, Sand Conditions in 627

Malleable Iron:—*continued* *Page*
Casting, Square vs. Round Risers in ... 641
Casting, Use of Cores in ... 643
Castings, Changes of Section Size in ... 625
Castings, Dendrites and Cracks in ... 613
Castings, Galvanizing Embrittlement in ... 603
Castings, Pattern Design for ... 612
Castings, Shrinkage in ... 613, 623, 629
Castings, Yields of ... 633, 647
Chromium, Nickel and Molybdenum Determination in ... 917
Combined Method of Chemical Analysis for ... 913
Effect of Isothermal Quenching on Spheroidization and Properties of Pearlitic ... 1189, 1204, 1214
Effect of Pressure on Physical Properties of ... 1149
Effect of Primary Graphite in ... 262
Melting, Additions in ... 452
Melting Control ... 441, 452
Melting, Gas Sampling System in ... 449
Metallographic Quality Test for ... 261, 266
Pipe Fittings, Bushed Patterns for ... 601
Pipe Fittings, Gating and Feeding ... 593
Pipe Fittings Melting and Pouring Practice ... 593
Pipe Fittings, Permanent Gating Method for ... 595
Photomicrographic Standards in Tests of ... 263
Silicon and Manganese Determination in ... 915, 917
Solidification, Factors Affecting Rate of ... 483, 496, 629

Malleableizing, Heat Flow Problems in ... 651

Manganese:
Additions, Effect on Bore Crack Formation ... 1250
Alloys, Dust and Fume Toxicity of ... 1369
Bronze, Effect of Antimony on Properties of ... 533
Bronze, Effect of Lead on Properties of ... 538
Bronze, Utilization of Fired Cartridge Brass in ... 527, 534
Cast Steel, Hardenability of Medium ... 469
Content in Aluminum, Effect of ... 790, 800
in Hard Iron, Malleable Iron, Gray Iron, Pig Iron and Steel, Determination of ... 915, 917
Metallographic Tests of Malleable Iron ... 261, 266
Metallographic Structures, Effect of Centrifugal Process on Non-Ferrous Alloys ... 397
Metals and Refractories, Chemical Reactions of ... 856

Melting:
Air-Hardening Steel ... 815
Brass and Bronze, Conditions in ... 846, 851
Cast Iron, Hydrogen and Humidity as Factors in ... 5, 6
High-Lead Alloys, Cupola ... 1141
Malleable Iron, Furnace Control in ... 441, 452
Non-Ferrous Metal, Operating Practice in Cupola ... 1137, 1143
Practice, Aluminum Cylinder Head Casting ... 34
Practice, Aluminum Permanent Mold Casting ... 76
Practice, Special Low Carbon Steel ... 910

Methods of:
Bore Crack Elimination in Flanged Steel Castings ... 1225, 1249
Casting Brass and Bronze Test Bars ... 1181
Casting Inspection, Magnetic Powder ... 182, 207
Chemical Analysis for Cast Iron, Malleable Iron and Steel, Combined ... 913
Die Casting Aluminum Alloys, Cold Chamber ... 543
Drying and Preheating Foundry Ladles ... 1288
Feeding Cast Steel Test Coupons ... 1256
Heat Flow Analysis, Electric Analogy ... 652, 659
Inoculant Addition to Mixing Ladle ... 710

Methods of:—*continued* *Page*
Making Gypsum Cement Patterns....1277, 1282
Malleable Casting Gate Removal.... 626
Measuring Permeability in Plaster Molds.... 965
Metal Analysis, Spectrochemical 889
Molding Cast Iron Cylinders, Four-Part Cheek.... 517
Molding for Sound Castings....1126, 1136
Occupational Disease Control in Foundry....1357
Permanent Gating for Malleable Fittings.... 595
Pouring, Centrifugal Casting.... 340
Precision Casting 351, 367
Rammer Mounting for High Temperature Sand Testing....1026
Timestudy, Effective 948
Tinning Gray Iron Castings.... 768
Training Foremen 566, 586

Mold:
Atmosphere Control 1053, 1069
Burnout in Precision Casting.... 367
Cavities Location in Thermal Dissipation.... 761
Cavities, Venting of....1134
Cavity in Centrifugal Casting.... 334
Conveyor System for Small Foundry.... 416
Cooling in Thermal Dissipation 762
Designs for Steel Castings.... 871
Materials for Thermal Dissipation.... 760
Metal Interface Reactions, Equilibrium Diagram of....1076
Oxide and Metal Penetration in....1072
Surface Gas Pressure 733, 743
Surface Properties at Elevated Temperatures.... 421
Surface, Spalling of 422
Temperature in Centrifugal Casting, Control of.... 411

Molding:
Materials, Gas Volume Measurement of.... 740
Methods for Sound Castings....1126, 1136
Practice in Centrifugal Casting 273
Process, Precision Casting by Investment....349, 381
Sand, Confined and Free Expansion of....423, 425
Sand, Hot Permeability Tests of.... 735
Sand on Malleable Iron Solidification Rate, Effect of.... 496
Sand, Rate of Hot Strength Development in.... 431
Setting Expansion in Investment.... 356

Molds:
for Centrifugal Casting.... 314
for Centrifugal Casting, Design of Die....289, 300
in Centrifugal Casting, Metal Flow in Vertical and Inclined.... 339
Centrifugal Casting Operating Practice with Permanent.... 291
Heat Flow in 650
Investment, Alloys Castable in.... 360
Permeability of Plaster 965, 971
Purposes of Spinning.... 333
Test for Penetration, Metal, in....1055
Thermal Expansion in Investment.... 356

Molybdenum Cast Steels, Bibliography on Copper-Bearing....1168
Molybdenum in Hard Iron, Gray Iron, Malleable Iron and Steel, Determination of 917
Mortar, Refractory 933

N

Navy "G" and "M" Metals, Test Bar Failures in 1175, 1183

Page

Nickel:
Carburizing Cast Steels, Hardenability of 468
in Hard Iron, Gray Iron, Malleable Iron and Steel, Determination of 917
Inoculant on Cast Iron Chill Depth, Effect of 707

Non-Ferrous:
Alloys, Influence of Centrifugal Process on Properties of 393
Alloys Metallographic Structures, Effect of Centrifugal Process on 397
Alloys, Properties of Statically and Centrifugally Cast 401
Metals, Centrifugal Casting of 407

Nucleation as a Cause of Superheating Effects on Cast Iron, Elimination of 152

O

Ovens *(See Furnace)*:

P

Pattern:
Design for Malleable Castings 612
Gating for Malleable Fittings 594
Types, Cast Steel Test Coupon 1252
Wax, Expansion of 353
Wax Formulae in Precision Casting 380

Patternmaking, Use of Gypsum Cements in 1271, 1276

Patterns:
Cement, Use of Shellac on 1284
for Malleable Fittings, Bushed 601
Methods of Making Gypsum Cement 1277, 1282
in Precision Casting 362

Pearlitic Malleable Iron, Effect of Isothermal Quenching on 1189, 1214
Pentrameters in Radiographic Inspection, Types of 1102

Penetration:
Defects in Castings 1053
Metal, in Mold, Causes of 1314
Metal, in Mold, Effect of Bentonite Additions on 1070
Metal, in Mold, Effect of Various Atmospheres on 1060
Metal, in Mold, Prevention of 1064
Metal, in Molds, Test for 1055
Mold-Metal Interface Reactions Causing 1076
in Mold, Metal and Oxide 1072
and Veining Defects, Mechanics of 1062

Permanent Mold Casting, Sponge Shrinkage in 1122
Permanent Mold Castings, Mechanized Production of Aluminum 49, 112
Permeability Measurements, Hot 734, 735
Permeability in Plaster Molds, Method of Measuring 965, 971
Phosphorus in Hard Iron, Malleable Iron, Gray Iron, Pig Iron and Steel, Determination of 915
Pig Iron, Silicon, Manganese and Phosphorus Determination in 915
Plaster Molds and Cores, Effect of Composition on Permeability of 971
Plaster Molds, Method of Measuring Permeability in 965

Porosity:
in Aluminum Casting 1116
in Bronze Casting, Gas 1121
in Tin Bronze Castings, Gas 853

Pouring:
Aluminum Cylinder Head Castings 36
Aluminum Permanent Mold Castings 55, 85
Practice in Centrifugal Casting 273, 340
Temperatures on Malleable Iron Solidification Rate, Effect of 495

Page

Preheating Foundry Ladles 1286, 1288

Pressure:
on Malleable Iron Properties, Effect of 1149
Mold Surface Gas 733
and Spinning Speeds in Centrifugal Casting, Formulas for 335

Properties of:
Aluminum Alloys, Effect of Grain Refiners on 811
Aluminum Alloy, Effect of Natural and Artificial Ageing on Tensile 1037, 1041
Aluminum Alloys Used for Cylinder Head Castings 34
Aluminum Cylinder Head Castings, Heat Treated 44
Aluminum Foundry Sand 22
Bond Clay vs. Western Bentonite, Bonding 864
Cast Iron, Effect of Ladle Inoculation on Uniform 690
Cast Iron, Effect of Si-Mn-Zr Inoculant on 671
Cast Iron, Effect of Superheating Factors on Structure and 113, 169
Cast Iron, Untreated and Inoculated 676, 684
Cast Steel, Air-Hardening 817
Cast Steel, Carbon-Molybdenum, Effect of Copper on 1151, 1162
Cast Steel, Centrifugal 319, 327
Cast Steel, Copper-Bearing 505, 1154, 1172
Cast Steel, Medium Carbon, Effect of Heat Treatment on 541
Cast Steel, Influence of Small Amounts of Alloying Elements on 2
Cast Steel, Plain Carbon, Effect of Heat Treatment on 1326
Cast Steel, Test Coupons, Relative 1254, 1260
Cements, Gypsum 1283
Centrifugally and Sand Cast Non-Ferrous Alloys 393, 401
Cupola Iron, Effect of Chromium-Bearing Inoculants on 699
Foundry Coke 8, 830
Malleable Iron, Effect of Pressure on 1149
Malleable Iron, Pearlitic, Effect of Isothermal Quenching on 1189, 1204
Manganese Bronze, Effect of Antimony and Lead on 533, 538
Mold Surfaces at Elevated Temperatures 421
Navy "G" and "M" Metals 1183
Sand Mixtures 739
Steel Castings, Effects of Open and Blind Risers on 1258
Steel Foundry Sands at Elevated Temperatures, Committee Report on Physical 977, 982
Vertical and Horizontal Centrifugal Casting 403

R

Radiographic:
Inspection, Aluminum and Magnesium Castings 70, 73, 102, 475
Inspection, Pentrameter Types in 1102
Inspection Symbols 1104
and Magnetic Powder Inspection of Steel Castings 175, 206
Specifications and Standards, Naval 1078, 1092
Standards, Castings Classification for Application of 179, 1083

Radiography:
Focus-Film Distance in Gamma-Ray 1095
in Foundry Control, Micrographic 1111
Magnetic Powder Inspection as a Complement to 190
Technique for Micrographic 1112

Raw Materials, Cupola 1, 9
Raw Materials in Malleable Iron Melting 442

Refractories:
Chemical Reactions of Metals and 856
Converter 854
Effect of Particle Size Distribution in 861

Refractories:—*continued*
Page
Foundry Applications of Insulating ... 937
Heat Conductivity vs. Weight of ... 929
Types for Ladle Linings ... 1287

Refractory:
Installation, Cupola ... 1138
Insulating Brick ... 932
Mortar ... 933

Risering:
Atmospheric Pressure ... 1129
for Brass and Bronze Test Bars ... 1182
for Controlled Directional Solidification ... 1126
Flanged Steel Castings, Influence on Bore Cracking ... 1221, 1232
and Gating Malleable Iron Castings ... 604, 612, 643
and Gating in Thermal Dissipation ... 761
Open and Blind, Effects on Properties of Steel Castings ... 1258

Risers and Riser Connections, Design of ... 1128
Risers in Malleable Iron Casting, Square vs. Round ... 641

S

Safety, Industrial ... 1347

Sand:
Adhering, in Centrifugal Steel Casting ... 331
Adhering, Mechanism in Cast Iron Practice ... 1313
Aluminum Foundry, Additions, Handling and Properties of ... 18, 23
Cast Non-Ferrous Alloys, Properties of ... 401
Conveyors, Small Foundry ... 415
Handling Equipment, Dust Control on ... 1361
Hot Permeability Tests of ... 735
Hot Strength, Rate of Development ... 431
Malleable Iron Casting, Conditions in ... 627
Mixtures, Elevated Temperature Compressive Strength Tests of ... 719
Mixtures, Properties of ... 739
Molding, Effect on Malleable Iron Solidification Rate ... 496
Molding, Expansion Tests of ... 423, 425
Molds in Centrifugal Casting, Green ... 302
Research Project, 1944 Committee Report on Foundry ... 960
Test Procedures, Elevated Temperature ... 711, 715

Sands:
Steel Foundry, Committee Report on Physical Properties at Elevated Temperatures ... 977, 1007
Steel Foundry, High Temperature Tests of ... 1011, 1022
Steel Foundry, Rammer Supports in High Temperature Tests of ... 1024

Scrap, Cupola, Use of ... 9
Sea Coal on Mold Atmosphere, Effect of ... 1065
Sea Coal on Malleable Iron Solidification Rate, Effect of ... 496

Segregation:
in Aluminum Alloy Casting, Stress ... 1118
in Centrifugal Casting ... 330, 343
in Leaded Bronze ... 1119

Shake-Out Equipment, Dust Control on ... 1361

Shrinkage:
in Bronze Casting, Centerline ... 1121
Calculation, Foundry Methods of ... 351
and Compensating Expansions, Casting ... 351, 354
Elimination by Accurate Thermal Dissipation ... 758
in Malleable Iron Castings ... 613, 623, 629

Shrinkage:—*continued* *Page*
Nature of Casting ... 361
in Permanent Mold Casting, Sponge ... 1122
in Steel Castings, Center-Line ... 181

Silicon:
Alloys, Dust and Fume Toxicity of ... 1365
on Aluminum Alloys, Effect of ... 790, 800
Aluminum Alloys, Types of ... 802
and Carbon Contents, Properties of Untreated and Inoculated Cast Iron vs. ... 684
in Hard Iron, Malleable Iron, Gray Iron, Pig Iron and Steel, Determination of ... 915, 917

Sintering Test, Report of Foundry Sand Research Subcommittee on ... 1311
Slag Control in Cupola Melting Non-Ferrous Metal ... 1140
Slag in Malleable Casting, Elimination of ... 616

Solidification:
Position of Gates and Risers for Controlled Directional ... 1126
Rates in Castings ... 650
Rate of Malleable Iron Castings ... 483, 493, 629
Tests of Malleable Iron ... 489
in Thermal Dissipation ... 762

Solubility of Various Elements in Molten Brass and Bronze ... 846
Specifications and Standards, Naval Radiographic ... 1078, 1092

Spectrographic Analysis:
Accuracy of ... 900
and Chemical Analysis, Comparisons of ... 901
Costs in ... 889
Effect of Humidity in ... 255
Effect of Sample Size in ... 253
Equipment for ... 249, 889
Fundamentals of ... 890
of Iron and Steel ... 248, 891
Practice ... 252, 256

Speed, Spinning, Factors for Acceleration and Flow in Centrifugal Casting ... 339
Speeds of Centrifugal Casting Machines, Spinning ... 333, 344
Speeds and Pressure in Centrifugal Casting, Formulas for Spinning ... 335
Spheroidization of Pearlitic Malleable Iron, Effect of Isothermal Quenching on ... 1189, 1214
Standards, Setting Production ... 945
Starch on Mold Atmosphere, Effect of ... 1066

Steel Castings:
Bibliography on Non-Destructive Testing of ... 975
Bore Cracks in Flanged ... 1217, 1249
Bore Cracks, Effect of Composition and Design on ... 1228, 1234, 1238
Bore Cracking Formation Mechanism in Flanged ... 1239, 1241
Brazil Production of ... 871
Center-Line Shrinkage in ... 181
Classification for Radiographic Inspection ... 1083
Committee Report on Non-Destructive Testing of ... 973
Conditioning to Standards of Quality ... 173
Cores for ... 871
Effect of Chilling, Heating, Mold Relieving, Core Traction on Bore Cracks in Flanged ... 1225, 1235
Effect of Copper in Low-Alloy and NE ... 501
Effects of Open and Blind Risers on Properties of ... 1258
Evaluation of Integrity of ... 173
Flanges, Application of Magnetic Powder Inspection to ... 201
Gating ... 871
Gating and Risering Influence on Bore Cracking in Flanged ... 1221, 1232
Geometry, Influence on Bore Cracking of Flanged ... 1231, 1237
Hardenability of ... 1325

Steel Castings:—*continued* *Page*
Making and Heat Treating Air-Hardening ... 814
Methods of Eliminating Bore Cracks in ... 1225, 1228, 1249
Mold Designs for ... 871
Non-Destructive Tests, Application of ... 173
Properties of Air-Hardening ... 817
Radiographic and Magnetic Powder Inspection of ... 175
Radiographic Specifications for Naval ... 1078, 1092
Radiographic Standards for ... 1083
Stress Relieving Air-Hardening ... 815
Structure and Properties of Centrifugal ... 319, 327
Veining in Flanged ... 1237, 1246

Steel:
Adhering Sand in Centrifugal Casting of ... 331
Alloy Cast, Composition, Control of ... 467
Alloying Elements, Effect on Properties of ... 2
Aluminum Additions in Centrifugal Casting of ... 328, 330
Analysis, Chemical, Combined Method for ... 913
Analysis, Chemical, Copper-Bearing Cast ... 1154
Analysis, Silicon, Manganese, Phosphorus, Chromium, Nickel, Molybdenum Determinations ... 915, 917
Analysis, Spectrographic ... 248
Bibliography on Centrifugal Casting of ... 329
Bibliography on Copper-Bearing Carbon-Molybdenum Cast ... 1168
Bibliography on Effect of Copper in NE and Low-Alloy Cast ... 515
Carbon-Molybdenum, Composition of ... 1153
for Castings, Special Low Carbon ... 904, 910
Centrifugal Casting of ... 313
Cooling Rate of Carbon-Molybdenum Copper-Bearing Cast ... 1155, 1173
Creep Resistance, Effect of Copper on Carbon-Molybdenum Cast ... 1163, 1174
Foundry Sand Properties at Elevated Temperatures, Bibliography on ... 1007
Foundry Sands, Committee Report on Elevated Temperature Physical Properties of ... 977, 982
Foundry Sands, High Temperature Tests of ... 1011, 1020
Foundry Sands, Hot Compressive Strength Tests of ... 1020, 1022
Foundry Sands, Rammer Supports in High Temperature Tests of ... 1024
Foundry Practice, Core Binders in ... 1320
Hardenability of Carbon Cast ... 465
Hardenability of Cast ... 459, 472, 1328, 1344
Hardenability of Chromium-Molybdenum Cast ... 466
Hardenability, Effect of Boron on ... 1338
Hardenability of Medium Manganese Cast ... 469
Hardenability of Nickel Carburizing Cast ... 468
Hardenability Tests of Copper-Bearing Cast ... 503, 511
Heat Treatment of Medium Carbon Cast ... 539
for Hot Tear Prevention, Use of Low Carbon ... 908
Melting and Alloying Practice, Air-Hardening ... 815
Properties of Copper-Bearing Cast ... 505, 1154, 1172
Properties, Effect of Copper on Carbon-Molybdenum Cast ... 1151, 1162
Properties, Effect of Heat Treatment on Plain Carbon ... 1326
Segregation in Centrifugal Casting of ... 330
Strength and Ductility, Effect of Heat Treatment on ... 1326
Structure and Properties of Centrifugally Cast ... 319, 327
Test Coupons, Experimental Practice in Producing Cast ... 1251, 1260
Valve Flanges, Hot Tears in ... 904
Weldability, Effect of Molybdenum on Cast Carbon ... 1152

Strength of Mold Surface, Rate of Development, Hot ... 431
Stress Relieving Air-Hardening Steel Castings ... 815
Structure, Influence of Centrifugal Process on Metallographic ... 397
Structure and Properties of Cast Iron, Effect of Superheating Factors on ... 113, 158
Sugar on Mold Atmosphere, Effect of ... 1066

Superheating: *Page*
Cast Iron, Carbon Equivalent as a Function in Effect on Properties and Structure of 162, 169
Cast Iron, Effects of Carbon-Monoxide and Hydrogen in 153, 161
Effects on Cast Iron, Elimination of Nucleation as a Cause of 152
Effects on Cast Iron, Gases as a Cause of 152
Factors, Effect on Structure and Properties of Cast Iron 113, 158

Symbols, Radiographic Inspection 1104

T

Temperature Control in Centrifugal Casting, Mold 411
Temperatures, Mold Surface Properties at Elevated 421
Temperatures, Pouring, Effect on Malleable Iron Solidification Rate 495
Tensile Properties of Aluminum Alloy, Effect of Natural and Artificial Ageing on 1041
Tensile Strength, Effect of Ladle Inoculants on Cast Iron 686
Test Bar Casting Procedure, Brass and Bronze 1175, 1182
Test Coupons for Cast Steel, Design of 1251, 1258
Test, Interpretation of Magnetic Powder 185
Test Methods, Influence of Centrifugal Process on Properties of Non-Ferrous Alloys 393
Test Methods for Penetration, Metal, in Molds 1055
Test Standards, Practicability of Magnetic Powder 180

Tests of:
Aluminum Alloys, Corrosion Fatigue 1045
Aluminum Cylinder Head Castings, Water 42
Aluminum Permanent Mold Castings, Chalk 75, 90
Aluminum Permanent Mold Castings, Pressure 81, 95
Casting Plasters, Apparatus for 967
Coke Properties 8
Copper-Bearing Cast Steels, Hardenability 511
Flanged Steel Castings for Bore Cracking 1218
Hot Permeability 735
Ladle Inoculants for Cast Iron 674
Malleable Iron, Metallographic Quality 261, 266
Malleable Iron, Photomicrographic Standards in 263
Malleable Iron Solidification 489
Mold Gas Pressure 743
Molding Sand, Confined Expansion 423
Rammed Converter Linings 865
Reproducibility, Spectrographic Analysis 256
Sand at Elevated Temperatures, Reproducibility of 711, 719
Steel Castings, Application of Non-Destructive 173
Steel Castings, Committee Report on Non-Destructive 973
Steel Foundry Sands at Elevated Temperatures, Physical Property 982, 1011, 1020
Steel Foundry Sands, Rammer Supports in High Temperature 1024
Steel Hardenability, End-Quench 463

Thermal Dissipation, Elimination of Microshrinkage by Accurate 758, 762
Thermal Expansion in Investment Molds 356
Timestudy, Effective Methods of 948

Tin:
for Bronze Alloys, Effect of High Antimony Content in 232
Content in Aluminum, Effect of 792
Electroplating to Cast Iron 772

Tinning Bronze and Brass Castings, Surface Preparation for 781
Tinning Gray Iron Castings, Surface Preparation for 768

Training:
Foremen, Methods of 564, 590
in Foundry 1302
Period for Engineer in Foundry 1297

Training:—*continued*
Technical, Value to Foundry ..... Page 1294

Transverse Deflection of Cast Iron, Effect of Ladle Inoculation on 688
Transverse Strength, Effect of Ladle Inoculants on Cast Iron 686

U

Urea on Mold Atmosphere, Effect of 1066

V

Veining Defects, Mechanics and Prevention of 1062, 1064
Veining in Flanged Steel Castings 1237, 1246
Vent Holes in Ladles 1288
Ventilation, Electric Melting Furnace, Local Exhaust 1351
Ventilation, General Foundry 1362
Venting Aluminum Permanent Mold Castings, Method of 54
Venting Mold Cavities 1134
Volatilization in Cupola Melting Non-Ferrous Metal 1141

W

Welding:
Aluminum Alloy 1045
Carbon-Molybdenum Copper-Bearing Cast Steels 1164, 1171
Cast Carbon Steel, Effect of Molybdenum on 1152
Cast Iron to Unlike Materials 773

Women as Foremen 577
Women, Training Foremen to Supervise 572

X

X-ray Equipment, Protection for Operator of 1357
X-ray Micrography in Foundry Control 1111

Z

Zinc Content in Aluminum, Effect of 792